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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Christmas Design

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A SCIENCE SERVICE PUBLICATION

## PSYCHOLOGY

# Phobias Keep Some Single

► ONE OUT OF THREE American does not marry.

The reason is often unconscious phobias about marriage, reports Dr. Jacob H. Friedman, director of the neuropsychiatric service of Fordham Hospital and chief of the Mental Hygiene Clinic at Lebanon Hospital.

Most of the people who are kept away from the trip to the altar by phobias do not know the real cause of their remaining single, Dr. Friedman explains in the *Journal of Hillside Hospital* (Dec.).

They fool themselves with all sorts of "reasons" which may appear valid to strangers and to the single individual himself, but are actually what the psychiatrist calls "rationalizations."

Reasons men give include that marriage entails too much responsibility; marriage means loss of liberty; deceived by one woman, they feel "all women are no good"; all women are like mothers; women are promiscuous and untrustworthy; marriage is too much of a gamble as shown by the divorce rate; married women are too demanding; too high standards in seeking a wife; fear of inheritance of mental illness.

Women also give false reasons for their

unconscious fears. Their reasons include fear of pregnancy; fear of inheritance of mental illness; parental attachment; fear of infidelity of future husband; guilt in relation to childhood sexual activity; fear of marital relations; fear of future husband possessing the undesirable traits of father or brother; jilted by one man, they think "all men are no good"; desire for a wealthy husband.

Dr. Friedman told of one young man, a patient who was referred for advice after he had failed his bar examination five times.

Dr. Friedman found the repeated failures were due to an unconscious need to keep himself poor and financially unable to marry. The young man came from a family opposed to marriage. His mother had died when he was 14 and his father never married again. He was reared by a spinster aunt and his uncles and aunts all remained single. He was one of five brothers and sisters, none of whom was married.

After a year of treatment, the patient began to associate with eligible girls. His symptoms vanished and later he married happily.

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## PUBLIC HEALTH

# Arthritis and Fluoridation

► DRINKING FLUORIDATED WATER will not cause arthritis, Dr. Charles Leroy Steinberg, Rochester General Hospital, Rochester, N. Y., told the annual interim scientific session of the American Rheumatism Association meeting in Bethesda, Md.

Dr. Steinberg reported on a two-year study of the fluoride content of the bones and joints of arthritic patients who had been drinking fluoridated water for many years.

Some of them were in their 70's and 80's. The amounts of fluorine found in those arthritides tested were normal, he said.

"Our study should dispel the fear that fluoridation of water as recommended by health authorities is a factor in the cause of arthritic conditions," he said.

There is enough evidence, Dr. Steinberg said, to confirm the fact that fluoridated drinking water will prevent tooth decay when the water contains one part per million of fluoride, and when the water is used by children from birth up to 12 years of age.

"Our studies were concerned with the possible ill effects that fluoridation may have on the adult and upon mankind in general," he said, "for it is known that in large quantities, in excess of five parts per million in drinking water, fluoride may have some detrimental effect upon bone and ligaments."

Dr. Steinberg and his team of researchers studied the tissues of the ribs, vertebrae and

joints of patients with arthritis. Normal amounts of fluoride were found in ribs and joints, he said, and slightly less than normal amounts were found in vertebrae.

The study was conducted at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y. Joint authors of the report were Drs. Dwight E. Gardner, Frank A. Smith and Harold C. Hodge of the division of pharmacology and toxicology, University of Rochester School of Medicine and Dentistry.

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## BIOCHEMISTRY

# Wound Healing Begins As Soon as Damage Done

► NATURE begins healing wounds immediately after they occur. The period of inactivity of tissue following infliction of the wound, long postulated by scientists, apparently does not occur.

This was reported by Dr. John H. Dunnington, Columbia University eye surgeon, at the University of California annual proctor lecture in ophthalmology.

Dr. Dunnington described animal experiments which were some of the first tracings of healing of eye wounds. They show the body begins repair work immediately with chemical reactions similar to those seen recently in other organs.

The end result is laying down a network of collagen, tough material that binds scar tissue together. The wound edges begin to gain in tensile strength, first evidence of healing, only after collagen is formed.

Dr. Dunnington showed the importance of early repair work by placing chemicals in wounds at different intervals after injury. Chemicals halted healing processes when applied early, but have no effect later in repair. He also found several drugs retard wound healing, but none was found that will accelerate it.

Still unknown is what triggers the early phase of healing. This is probably release of enzymes that break down protein into building blocks of new connective, or scar tissue.

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## PSYCHOLOGY

# Common Origin for Race Riots, Fashion Changes

► CHANGES in fashion, race riots, religious revivals, even wars and stock market crashes with economic depressions have a common origin.

They are all forms of mental epidemics, Dr. F. Krafft Taylor of Maudsley Hospital, Denmark Hill, London, England, reported to the British Association for the Advancement of Science.

They arise when emotions, relatively harmless in an individual, are shared, although at first not expressed, by large numbers in a community. The susceptible population is like a volcano, ready to erupt when incited by an idea that lets them vent in company their otherwise suppressed common emotion.

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## MEDICINE

# Hospitals Are Too Noisy For Good Heart Diagnosis

► FAINT HEART MURMURS that may be early signs of serious heart disease are going unnoticed in noisy hospitals, Dr. Dale Groom of the Medical College of South Carolina, Charleston, S. C., told the American Medical Association clinical meeting in Seattle.

In an experiment to see just how noisy a modern hospital is, Dr. Groom found that the heart clinic office, examining rooms and the library were not much quieter than the hospital's boiler room.

The experiment was done, he said, as a study in hearing the faint heart murmurs that may be masked by a high level of background noise. He found that the noise level inside a DC-6 airliner was 105 decibels while the noise level in the clinic examining rooms ranged from 72 to 75 decibels.

Dr. Groom said that heart murmurs may help the physician discover diseases of the heart valves many years before the heart enlarges or fails. It can make a big difference in outlook and treatment.

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## MEDICINE

# TB Germ Makes Poison

**Isolate chemical that may give clue concerning how the cord factor, which is substance in TB germs believed toxic to human tissue, is synthesized by the virulent form of TB bacilli.**

➤ A DISCOVERY that may be the clue to learning how the tuberculosis germ makes its poison has been made by a Wisconsin scientist who received a Christmas Seal grant from the National Tuberculosis Association, New York.

Dr. Dexter S. Goldman, a biochemist at the Veterans Administration Hospital, Madison, Wis., isolated a chemical that causes a radical transformation in one of the many types of tuberculosis germs. Some tubercle bacilli are virulent, or capable of causing disease. Others are avirulent, or harmless.

Certain exterior distinctions have been made between the virulent and harmless strains. For example, when virulent germs are grown in the laboratory, they tend to cling together sideways in a cord formation. This is not characteristic of the harmless germs.

Some scientists now believe they have identified the exact element in the virulent germs that is toxic to human tissue and thus causes disease.

This substance, called the "cord factor," is a fatty material present in the virulent strain and can be isolated from it. The isolation and identification of this cord factor resulted from many years of work by many scientists.

The discovery by Dr. Goldman and his colleagues may give a clue as to how the toxic cord factor is synthesized by the virulent tuberculosis germ. Dr. Goldman isolated a chemical that appears to change the unrecorded growth pattern of the harmless germs to a cord-like formation similar to that of the disease-causing strains.

He calls the chemical CIF, or cord-inducing factor. It was discovered when colonies of harmless TB germs changed their growth pattern to a corded form because a foreign organism had contaminated the culture plate.

Dr. Goldman does not yet know whether the change to cord-like formation is accompanied by a change from harmless to virulent strain.

He believes the harmless TB bacilli are genetically incapable of carrying out one step in the chain of reactions leading to formation of the cord factor, and that the material produced by the foreign organism in the culture plate acted to overcome the genetic block.

With his associates at the VA hospital, Dr. Goldman is now trying to find a way to reverse the procedure. He hopes to find a chemical means of blocking the formation of the cord factor, and thus eliminate or reduce the virulence of the TB germs.

A special contribution to Dr. Goldman's

research was made by the Wisconsin Anti-Tuberculosis Association, Dr. Floyd M. Feldmann, medical director of the National Tuberculosis Association, said.

The grant to Dr. Goldman is one of 42 that has been made recently by the National Tuberculosis Association. The NTA's research program, according to Dr. Feldman, is made possible by Christmas Seal funds from its affiliated associations throughout the country.

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## GENERAL SCIENCE

## Life Span Same in Space as on Earth

➤ EINSTEIN'S THEORY suggests to some that space travel may be the fountain of youth, but to a Harvard medical man, it does not.

Dr. William R. Brewster, Jr., of Harvard Medical School debunked many popularly held theories that man will not age as fast in space as he does on earth, at the meeting of the American Rocket Society in New York.

According to some interpretations of Ein-

stein's Special Theory of Relativity, if you go sailing around in space at half the speed of light and leave a twin brother back home, he will get twice as old as you do.

If your space trip takes ten years, when you get back you will find your earthly twin ten years older, while you would have aged only five years.

This effect of slowing up life's processes by extreme speed has been compared to hibernation, where the motion of the space ship causes a kind of suspended animation.

Slowing up life's processes works both ways, Dr. Brewster said. It depends on whether you say the space ship is moving away from the earth or the earth is moving away from the space ship. No matter which twin brother you are, you will see the other aging faster. When the two of you are back home, however, one will not be any older than the other.

Dr. Brewster also questioned what will happen to man when he gets completely away from the earth's gravitational pull. There is no way to tell, he said, for now he can only be made weightless within the earth's gravity. That is not the same kind of weightlessness he will experience in space.

Another important factor being overlooked, Dr. Brewster said, is the effect of the earth's magnetism on people. The vital combination of oxygen and iron in the blood may be influenced by magnetism. Without this magnetic attraction, the blood might lose its ability to carry oxygen.

Associated with Dr. Brewster in this study were Drs. Harriet B. Brewster, Majic S. Potsaid and James P. Isaacs.

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**GROUND LEVEL BAIL-OUT**—Royal Air Force squadron leader J. S. Fifield gave living proof of the ground-level efficiency of a British automatic ejector seat at Chalgrove Airfield, Oxfordshire, England, when he was hurled from a jet moving along the runway and floated safely to earth. He is shown here seated in the air before his parachute opened.

## ASTRONOMY

# Age for Earth Given

► AN AGE for the birth of the earth and a prediction that it may be dying are voiced by Dr. E. J. Opik of Armagh Observatory, Northern Ireland.

The earth is approximately 3,500,000,000 years old, according to Dr. Opik's calculations, published in the annual report of the Smithsonian Institution.

The Milky Way galaxy, only one system containing several billion stars among millions of such systems, may be 1,000,000,000 years older.

Both the earth and the Milky Way are relative youngsters, however, when compared to the age Dr. Opik says is the upper limits that can be assigned to the universe itself—6,000,000,000 years.

The birthday for the universe, the Irish astronomer points out, is the time of the creation of the present star systems or state of matter out of which they are evolved, and not the present configurations.

Dr. Opik also suggests the universe may be "bound for inevitable death." It may be, he reports, that the universe is oscillating, expanding and then contracting, re-

turning to the primitive state of matter. If this is the case, he states, there may have been many such cosmic structures in the past and there may be many more in the future.

The death of the present universe will come about, Dr. Opik thinks, with the eventual return to the highly condensed state of matter, pure nuclear highly condensed particles such as neutrons, electrons and protons out of which it evolved.

Then, he says, another universe, but far different from this one, may evolve by the same processes.

To arrive at his conclusions, Dr. Opik combined such factors as the rate at which great star galaxies are pulling away from each other; calculations on the average density of matter in space and the amount of decay of naturally occurring radioactive elements like uranium and thorium.

Four scientists recently gave the age of the earth as 5,000,000 years and that of the Milky Way as 7,500,000 years. (See SNL, Oct. 20, p. 245).

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## MEDICINE

# Hypnosis for Anesthetic

► HYPNOSIS has been found to be a quick and effective substitute for anesthetics when setting broken bones, Dr. L. Goldie of the Maudsley Hospital, London, reports in the *British Medical Journal* (Dec. 8).

Used in the emergency room of a general hospital, hypnosis was tried on random patients who required minor operations, such as incisions, the removal of foreign objects, stitching and the setting of broken bones.

The hypnotic procedure, Dr. Goldie says, proved most effective during the stitching of wounds and the setting of bones.

No anesthetics were needed to reset 26 out of 28 consecutive cases of fractured bones when hypnosis was used. Without hypnosis, 22 out of 27 cases needed an anesthetic.

Patients to be hypnotized were asked to think of a variety of ways to distract their attention from their injury. They were told that if any pain was felt they could ask for an anesthetic.

Some were asked to picture vividly a scene and a time when they were completely relaxed, or they were told that with each breath their muscles were growing more loose and relaxed.

In some cases it took only ten minutes of this suggestive method before all pain disappeared. Then bones were set as smoothly and gradually as possible.

Even without any specific suggestion about forgetting, not one of the bone patients treated under hypnosis could re-

member anything about the procedure when it was over.

Dr. Goldie states that the use of hypnosis for minor injuries in a hospital could reduce the amount of anesthetics administered and could be useful for emergency cases who had just eaten.

For those who have just dined, he points out, it is usually necessary to wait until the food is digested before getting an anesthetic drug.

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## MEDICINE

# Use X-Rays to Diagnose Acute Appendicitis

► USING X-RAYS to diagnose attacks of acute appendicitis was reported by Dr. David S. Carroll, X-ray specialist from Memphis, Tenn., to the Radiological Society of North America meeting in Chicago.

Acute appendicitis causes 17,000 deaths per year in the United States alone, Dr. Carroll said, and any factor that will aid in early diagnosis and care is of considerable importance.

Dr. Carroll has used X-rays to show up the presence of calcified enteroliths, or stones, inside the appendix of 34 patients. These stones are believed to be one of several causes of appendicitis, and in some cases are difficult to diagnose.

"Most of the patients had symptoms and physical findings such that acute appendi-

citis was the obvious pre-operative diagnosis," Dr. Carroll said. "However, in a few of the patients the symptoms and signs were more difficult to interpret, and the radiological demonstration of calcified appendiceal enteroliths contributed a great deal of the differential diagnosis."

When these stones are present, Dr. Carroll reported, there is less time between when the symptoms first appear and when the appendix may burst. X-ray demonstration would then be of considerable help in early diagnosis.

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## PSYCHOLOGY

# No Learning While Asleep

Scientists also find an objective way of determining whether and when a resting person is actually asleep. Seven levels of sleepiness are noted.

► **SCIENTIFIC EVIDENCE** that it is not possible to learn during sleep is reported in *Science* (Nov. 30).

Experiments on 21 men of average or better IQ were made by Dr. Charles W. Simon of the Hughes Weapon Systems Development Laboratories, Culver City, Calif., and William H. Emmons of the Rand Corporation, Santa Monica, Calif.

In addition to demonstrating that the men did not learn while they were asleep, the scientists also found an objective way of determining whether and when a resting person is actually asleep. This will be useful in medical and psychological research on problems of sleep.

Seven levels of sleepiness were noted. They ranged from a light drowsy state to very deep sleep. Each level is distinguished by a characteristic pattern of brain waves.

When you lie down and close your eyes, at first your brain broadcasts a continuous pattern of electric signals known to scientists as "alpha rhythm."

As you gradually drift off to sleep; you go through a light drowsy state, drowsy state, deep drowsy state and then you approach the line between awake and asleep before you enter first a light sleep, then a deep sleep and finally a very deep sleep.

Each of these stages is marked by a different pattern of brain waves.

First, in the light drowsy state, the alpha waves are interrupted or "blocked" as the scientists say. Playing questions and answers to you on a phonograph will restore the alpha pattern—that is, they serve to rouse you. Later the alpha pattern drops out more of the time and it slows down.

In the transition state a new pattern, called by the scientists "delta rhythm," is broadcast, mixed at first with the alpha pattern. When you are in a very deep sleep, your brain broadcasts only the delta pattern with the waves of maximum amplitude.

Learning during sleep was tested in this way. Before they went to bed, the men were pretested on 96 factual questions on history, sports, science and the like. Then they retired to sound-proof, air-conditioned booths for an eight-hour night's sleep.

During the night the same questions and the correct answers were played to the men at five-minute intervals. Then in the morning, the test was repeated to see which of the answers not known the night before could now be given.

It was found that during the first four levels, the men could hear the questions and recall the answers. During these levels the alpha rhythm predominated.

As soon as the alpha rhythm dropped out

and the delta pattern took over, then the ability to hear or recall what is said or played ends. If anyone wants to teach you then, he must first wake you up.

These findings add a new dimension to our measures of sleep. Researchers can now measure not only the length of sleep but also how deep the sleep.

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## PHYSICS

## Physics Institute Plans New Building

► **A NEW HEADQUARTERS** building is planned for the American Institute of Physics, an association of five scientific societies with 17,000 members throughout the country.

The Institute has launched a drive to raise half a million dollars, half for financing the building, and \$200,000 for speeding the flow of research information through new and improved technical journals.

The remaining \$50,000 of funds to be pledged from industry and Institute members is earmarked for attracting and training more young people to become physicists.

Expansion of the number and activities of physicists during and after World War II has made the Institute's present building inadequate.

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## NUTRITION

## Dietitians on Diet Show Potato's Value

► **THE POTATO** has high quality protein, important for tissue building, it appears from diet studies made on student dietitians.

The young women studied were students in a hospital in Lima, Peru. The findings, by Harvard University scientists, are reported in the *Journal of Nutrition*.

Not only the potato, but other vegetables and fruits supply protein although in relatively minor amounts. These amounts, however, may be more important than has been realized to supplement the protein of cereal diets eaten by large parts of the world's population.

In the studies, the usual diet of the young women, consisting of vegetables and other foods of plant origin, was found to contain the minimum or more of all the essential protein-building amino acids with one exception. The exception was methionine.

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**CHECKING DIODES**—Completed germanium diodes at a Hughes Aircraft Company's plant in Los Angeles are checked by operator of a diode orientor that signals, both audibly and visually, if the germanium crystal is in the proper position with regard to the lined color codes indicating which way current flows.

## HORTICULTURE

## Weed Killers Dangerous May Hurt Ornamentals

► **WHEN USING WEED KILLING** chemical sprays, be careful not to damage nearby turf grass or ornamental plants is the advice of Marston H. Kimball, ornamental horticulturist at the University of California at Los Angeles.

"A large number of chemical weed killers are commercially available," he said. "These include soil sterilants, fumigants, contact sprays and certain herbicides which release material toxic to germinating seeds but are not toxic to most mature plants."

"When properly applied to flowerbeds, flagstone walks or patios, soil sterilants are not hazardous to nearby turf grass. Leaching by rain or irrigation carries the chemical predominantly downward with little lateral movement."

"The principal hazard is to trees and shrubs having roots extending under treated areas. The roots may pick up toxic materials and transport them to trees or shrubs where systemic damage may occur."

Fumigants may often be used to control perennial weeds near turf plantings, Mr. Kimball said. They are only temporary as no toxic materials remain in the soil. Contact weed killers kill only parts of the plants actually sprayed.

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## GENERAL SCIENCE

# H-Bomb Problem Remains

Many other problems caused by modern science and technology are also of public concern, although these are long-range ones and overshadowed by immediate crisis.

► **PRESIDENT EISENHOWER'S** re-election by no means solved the H-bomb problem, Dr. Eugene Rabinowitch charges in the *Bulletin of Atomic Scientists* (Dec.), of which he is editor.

The University of Illinois physical chemist says the most important challenge to man is the world-wide danger of the nuclear arms race.

There are, however, other problems raised by the modern development of science and technology that are also of public concern.

Among these, Dr. Rabinowitch lists the genetic danger of the excessive use of X-ray and other radiation in medical treatment, the possible link between cigarette smoking and lung cancer, the explosive population growth in technically backward countries, the increased preservation of defective hereditary genes, and the world-wide pollution of the air by modern man's machines and industries.

Dr. Rabinowitch says that the experience of the H-bomb debate in the 1956 presidential election contest thus poses to scientists the question of how to educate the public, in the future, to the proper understanding of radioactive contamination of the atmosphere by fission products, and other scientific aspects of the H-bomb tests, and also of the many other problems raised by science and technology, some of them mentioned in his list.

Solving these problems is necessary for the survival of man as a successful species, Dr. Rabinowitch states. Their importance is "equal to, and in some cases greater than, that of most political, economic or cultural subjects traditionally arousing public interest."

These long-range problems are overshadowed by the immediate military and political crisis, which Dr. Rabinowitch says is also influenced by the existence of H-bombs and by the other scientific methods of making war.

He points out that the development of the two present conflicts, in Hungary and in the Middle East, has thrown a "blinding light" on the "terrible reality" created by A- and H-bombs and long-range missiles.

The West is paralyzed in the face of events such as the ruthless Soviet suppression of the Hungarian uprisings because it cannot use the threat of war to support diplomatic pressure, as was once possible. Dr. Rabinowitch notes that it makes no difference whether the U. S. is superior, equal or inferior to the Soviet Union in air-atomic arms "because atomic war would only mean mutual destruction." Those to be helped would be destroyed as well as their oppressors and would-be protectors.

Atomic weapons can be used for blackmail, and Dr. Rabinowitch points out that the Soviet leaders have clearly revealed they are fully aware of this.

"With brutal frankness," Soviet Premier Bulganin threatened England and France with atomic destruction in letters sent Nov. 5, he reports.

Dr. Rabinowitch concludes the threat seems to call for a new, common Western policy and strategy, a Western armed force able to match the Soviet army on the continent and in the Middle East, and an agreed and clearly proclaimed policy and strategy of answering local aggression any place that it occurs.

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## MEDICINE

## New Arthritis Drugs

► **TWO NEW DRUGS**, claimed to be more effective against arthritis than any now used, were announced at the American Rheumatism Association meeting in Bethesda, Md.

Medrol, one of the anti-arthritic drugs, is a hormone that chemically resembles cortisone and hydrocortisone but having 12 to 18 times the potency and "lacking the chief side effects" of the older drugs, Dr. E. Myles Glenn of the Upjohn Company, Kalamazoo, Mich., where the drug was developed, reported.

Up to now, all results have been on experimental animals, however, and there are no reports on Medrol's effectiveness on humans.

Medrol, Dr. Glenn said, was tailor-made to remove the chief defect of older arthritis drugs, that of causing too much salt and water to be held in the body.

The other new drug, reported on by scientists from the Sloan-Kettering Institute for Cancer Research, New York, and the Hospital for Special Surgery, New York, has already been tried on a group of 18 arthritic patients for periods ranging from five months to a few weeks.

So far, the new hormone, known as triamcinolone, has produced no serious side effects and all the arthritic patients treated have responded well. Within 72 hours, they all lost from four to eight pounds and the characteristic swelling of the tissues subsided.

The investigators emphasized that not enough time has elapsed and too few patients have been treated to know whether more prolonged use of triamcinolone will create any bad effects. However, they said,

## RADIO

Saturday, Dec. 22, 1956, 1:45-2:00 p.m., EST  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Mr. Davis will review the year's major science events and predict scientific developments for 1957.

## TECHNOLOGY

## Christmas "Snow" Using A Push-Button Can

See Front Cover

► **REGARDLESS** OF climate and geography, "snow" for Christmas decorating is now being produced at the push of a button.

Aerosol containers of artificial snow, in white and other colors, are being used by one out of every three United States families, according to a survey conducted by the Du Pont Company.

A Christmas tree branch decorated with snow is shown in the photograph on the cover of this week's SCIENCE NEWS LETTER.

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its demonstrated potency and the fact that no bad side effects have yet been seen suggests that it should get a large scale trial.

This new compound is not yet on the market but will be distributed by Lederle Laboratories sometime in the future.

Those reporting on this drug were Drs. Leon Hellman, B. Zumoff, M. K. Schwartz, T. F. Gallagher, Carl A. Berntsen and Richard H. Freyberg.

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## BACTERIOLOGY

## Bacterial Cultures Change in Storage

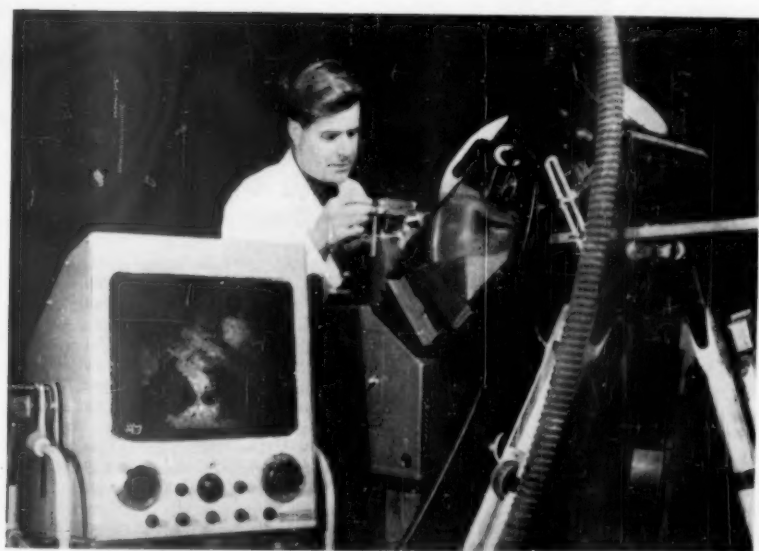
► **BIOLOGICAL SCIENTISTS** who store cultures of bacteria in a refrigerator and later employ them in their research may no longer be working with the same culture.

This is the conclusion of Harold W. Bretz, Ph.D. candidate at Purdue University, who has been working under the direction of Dr. S. E. Hartsell of Purdue's Department of Biological Sciences.

Working with mixed cultures of the common human intestinal parasite, *E. coli*, Mr. Bretz found that, at the standard storage temperature of four degrees Centigrade, some mixtures will survive, some will not, and some may even show an increase in numbers during storage.

Mr. Bretz speculated that as cells die they may either furnish nutrients that other still-living cells utilize, or they may release some unknown protective substance that counteracts the killing influence of cold, or they may do both.

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**TV FOR ATOM RESEARCH**—An experimental television microscope is being used at Britain's Atomic Energy Research Establishment, Harwell. It enlarges highly radioactive metal specimens on a screen and permits their examination without damage to the eyes. A demonstration image is shown here on the 15-inch screen of the TV microscope.

## GEOLOGY

## How Uranium Is Made

► THE CHEMICAL PROCESS that uranium undergoes in its own natural underground laboratory is being unfolded by Dr. Robert M. Garrels of Harvard University.

The complete picture of uranium's origin and evolution promises to help the prospector find new deposits of the atomic-age mineral.

Color and a coffee-like percolation are keys to nature's manufacture of uranium ore, Dr. Garrels and scientists of the U. S. Geological Survey and Atomic Energy Commission have found.

When uranium ores come in contact with air, their color changes. At depths where there is little or no oxygen, the scientists think, the ores will be gray to blue-black in color. However, as the earth's surface wears away and exposes the mineral to the air, the ores turn to the yellow color that every sourdough looks for when prospecting.

The scientists also think that they will be able to predict where uranium is most likely to be found. To learn about this, they are experimenting with many of the naturally occurring uranium compounds, such as those found in copper-uranium and vanadium-uranium ores.

They have learned, Dr. Garrels reports, that uranium ores dissolve in water best, when they are in the oxidized state.

When combined with vanadium, the Harvard scientist discovered, uranium does

not travel in water solutions. When combined with copper and other compounds, however, it does move with ground and stream waters and some of it is eventually carried out to sea.

The fact that uranium has a high chemical activity and can be dissolved means that it is widely distributed over the surface of the earth, Dr. Garrels states.

The highest concentrations, he says, occur in veins and replacement deposits. In unoxidized veins, uranium is found mostly as pitchblend.

In oxidized states, it is in replacement deposits such as the rich deposits found in the Colorado Plateau.

Geologists believe the uranium now being mined in the Colorado Plateau, richest in the United States, was formed in nature's underground laboratory in the following way:

1. The uranium was dissolved by ground water.
2. The ground water carried the dissolved uranium through rocks deep in the earth.
3. As it traveled through the earth, it came in contact with reducing agents such as fossil logs, leaves or twigs. This reaction precipitated the uranium.
4. When the uranium was then exposed to the air by erosion of the overlying rocks, it became oxidized and turned to the familiar yellow color.

Science News Letter, December 15, 1956

## MEDICINE

## Find Echo Virus in Cases Of Nonparalytic Polio

► A DISEASE that produces all the symptoms of polio but is gone within three to ten days appears to be caused by a type of virus found in the intestine.

This nonparalytic form of polio, generally known as aseptic meningitis, is now thought to be caused by a virus called ECHO, for enteric cytopathogenic human orphan, type 6 that has been found in the intestinal tract of patients suffering from the disease.

The ECHO virus is one of a variety of intestinal viruses and has been classified into 12 types. Type 6 has been found in victims of aseptic meningitis.

In seven reported cases hospitalized after an outbreak of the disease in New York in 1955, there was no rise of polio virus antibodies in the patients.

However, within five days they had all developed ECHO type 6 antibodies and recovered shortly after. Six months later this special antibody was still found in the body, the only after effect of the disease being loss of abdominal reflexes by two patients.

Isolation of the ECHO type 6 virus and its role in causing aseptic meningitis is reported in the *Journal of the American Medical Association* (Nov. 30) by Drs. David T. Karzon, Almen L. Barron, Warren Winkelstein Jr., and Seymour Cohen, of Children's Hospital, Buffalo, N. Y., University of Buffalo School of Medicine, and the Erie County Health Department, New York.

Science News Letter, December 15, 1956

## PSYCHIATRY

## Halt Seen in Increase Of Mental Patients

► A BREAK has occurred in the steady increase of mental patients, it was reported to the National Association for Mental Health meeting in Washington.

F. Barry Ryan Jr., president of the Association, said some state hospitals have reported that last year, for the first time, discharge of cured or improved patients was catching up with the intake of new patients.

In 1955, he said, mental patients increased by only 6,000, compared to an average annual rise of 12,000 over the last 10 years. Slowdowns like this have occurred before, he reported, but indications point to the beginning of a true break in the steep climb of the past 25 years.

He attributed this progress both to the effectiveness of modern treatment, such as psychotherapy, tranquilizing drugs and electroshock, and to the fact that more patients are getting treatment instead of custodial care.

At the end of 1955, Mr. Ryan said, there were a total of approximately 750,000 patients under mental hospital care, and the cost of treating and maintaining them was nearly a billion dollars.

Science News Letter, December 15, 1956

## DENTISTRY

**Underactive Thyroid Gives Rats Tooth Decay**

► AN UNDERACTIVE THYROID gland causes an increase in tooth decay in rats, it is reported in the *Journal of the American Dental Association* (Dec.).

Prior tests on the thyroid's effect on dental caries showed that, when additional thyroid was fed to a group of experimental animals, there was a significant reduction in the amount of decay.

In the present study, thyroid functioning was stopped altogether by injecting radioactive iodine in the rats. When 500 microcuries of the iodine were given, thyroid function was halted and there was a 25% increase in dental caries.

By spacing the shots of the radioactive substance, it was also found that the amount of thyroid activity is related to an increase in tooth decay. As the thyroid became less active, a greater incidence of new dental caries was noted.

One group of animals received two doses of 250 microcuries each over a short period of time, and another got five doses of 100 microcuries each over a longer period. The first group had only seven percent more caries than a normal group, and the second showed no change from normal.

The researchers also made a comparison between the effectiveness of fluoridated water and the addition of thyroid to the diet. Both slowed down tooth decay.

With animals that received fluorine alone, the decay rate was 29% less than for those that did not get it. When desiccated thyroid was added to the diet, new dental caries decreased 39%.

The research was conducted by Drs. David Bixler, Joseph C. Muhler and William G. Shafer of the University of Indiana.

Science News Letter, December 15, 1956

## BIOCHEMISTRY

**Find Chemical Kills Normal Connective Cells**

► A CHEMICAL that kills normal connective tissue cells, but has almost no effect on human cancer is being tested for use in obtaining strains of pure cancer cells in tissue culture.

Scientists at the Sloan-Kettering Division of Cornell University Medical College report their experiments in the *Journal of the American Chemical Society* (Nov. 5).

In connection with the extensive inquiry being undertaken in many laboratories for substances that will affect cancer cells differently from ordinary cells, several purine chemicals were investigated.

The hope is that there will eventually be found a chemical that can be administered to those who have cancer and result in killing the cancer or at least a reduction in its growth rate.

What the Sloan-Kettering group has found now is somewhat the reverse of this. They prepared a chemical similar to one

that has been shown to stimulate the division of some plant cells in tissue culture. This preparation was 6-furfurylamino-9-beta-D-ribofuranosylpurine.

When this was used to treat, in the test tube, adult human fibroblasts, which are normal cells, 99% of these cells were killed. However, the chemical was without effect on the rate of cell division in three strains of human carcinoma cells.

Studies are now underway to test the usefulness of this chemical for ridding human cancer biopsy cultures of connective tissue cells. This might be an aid to cancer diagnosis and further research on other compounds possibly useful in treating cancer.

The team of scientists connected with the Sloan-Kettering Division of Cornell University Medical College consisted of Drs. Alexander Hampton, John J. Bieseke, Alice E. Moore and George Bosworth Brown.

Science News Letter, December 15, 1956

## MEDICINE

**Drug Lowers Blood Pressure and Anxiety**

► ANOTHER DRUG to combat high blood pressure, said to offer advantages over older drugs, was announced by Dr. Karl J. Brunings, director of chemical research for Chas. Pfizer & Co., Inc., Brooklyn, N. Y., at the American Chemical Society meeting in St. Louis.

The new drug, trade-named "Moderil," reduces blood pressure by cutting communications between selected nerve centers and the arteries they serve.

It is extracted from the Indian snake root, *Rauwolfia*, source of many of today's tranquilizing drugs. The drug seems to control anxiety and tension as well as high blood pressure, Dr. Brunings said.

This relief of anxiety often associated with high blood pressure is believed to be an added advantage of the drug.

"It has been given to hundreds of patients with hypertension and anxiety and has been found to be highly effective," it was reported.

Science News Letter, December 15, 1956

## NATURAL RESOURCES

**Timber Money to Go To Schools and Roads**

► NATIONAL FORESTS in the United States yielded a record amount of commercial timber during the year ending June 30, 1956, the U. S. Department of Agriculture has reported.

The timber harvest, nearly 7,000,000,000 board feet, was valued at \$97,619,518, an increase of more than \$26,000,000 over the value of the preceding year's cut.

One-fourth of this, about \$24,404,879, will be used for roads and schools in national forest areas. One-tenth will be used for construction within the national forests themselves. The remainder will go to the United States Treasury.

Science News Letter, December 15, 1956

**IN SCIENCE**

## SURGERY

**X-Rays Used to Find Left-Over Gallstones**

► X-RAYS are now being used to spot gallstones missed during surgery.

Called cholangiograms, the X-ray pictures are made after the injection of a radio-opaque fluid and help to reveal stones left after gall bladder operations. They are also used on "poor risk" patients where unnecessary surgery should be avoided.

The new diagnostic technique was reported to the American Medical Association clinical meeting in Seattle by Drs. William E. Sullens and George A. Sexton of the Northwest Medical Group, Great Falls, Mont.

Cholangiograms have been used before to show up gallstones after other examinations had failed, the doctors said, but this is the first time they have been used to spot the many stones left after surgery.

The problem is a major one, they said, with left-over stones remaining in up to 26% of patients after operation.

Science News Letter, December 15, 1956

## GEOPHYSICS

**Late Bathers on West Coast May See Satellite**

► LATE SEASON BATHERS along southern California beaches next year may be the first Americans to spot the earth satellite in flight.

John V. Sigford, an aeronautical engineer for Minneapolis-Honeywell, said this is because the satellite will be sent spinning around the earth in a west-to-east direction in order to take advantage of the earth's rotation.

After the satellite-carrying rocket is launched from Cape Canaveral, Fla., and settles in its orbit, it is expected to take about an hour to whirl past Africa, the Far East and the Pacific Ocean before passing over California on its first lap around the earth.

Mr. Sigford pointed out that sharp eyes and good seeing conditions will be needed to spot it, however, since its expected magnitude will be that of a sixth magnitude star, the faintest visible to the unaided human eye. To the naked eye, it will look like a golf ball headed for the pin on a green ten miles away, Mr. Sigford calculates.

"If everything goes right," Mr. Sigford said, "the satellite should circle the earth every 90 minutes, or about 450 times while the moon is loafing around once."

Minneapolis-Honeywell is building the guidance system for navigating the 20-inch sphere into its proper earth-circling orbit.

Science News Letter, December 15, 1956



# CE FIELDS

## ASTRONOMY

### A Million Tons of Cosmic Matter Fallout Yearly

► ONE MILLION TONS of cosmic material smaller than four-thousandths of an inch in diameter rain on the earth annually, a U. S. scientist has found.

Dr. Paul W. Hodge of Yale University Observatory, New Haven, Conn., said a year-long survey of atmospheric dust falling at three stations in isolated areas showed the fine particles are probably meteoritic debris. Somewhat larger particles, although also very tiny, are found in densely populated areas.

The two kinds of spherules seem to be of an entirely different nature, Dr. Hodge reports in *Nature* (Dec. 1).

The yearly world-wide fallout of one million tons for the smaller particles is based on the assumption their density is the same as iron.

The principal collecting sites were the Smithsonian Astrophysical Observatory's Table Mountain Station above the Mojave Desert of California, a field site of the Geophysical Institute in central Alaska, and the Meteorological Observing Station of the Canadian Meteorological Service at Resolute, on Cornwallis Island in the Arctic.

Science News Letter, December 15, 1956

## MEDICINE

### Studies of a Tapeworm Give Clues to Immunity

► STUDIES OF A TAPEWORM, found both in mice and men, are furnishing science with new information on the general problems of immunity.

Dr. Donald Heyneman, zoologist at the University of California at Los Angeles, is studying the unique life cycle of the dwarf mouse tapeworm and the immunity of its host.

"Most people are aware of immunity induced by bacteria and viruses, but few know that it is possible to produce immunity to a ten-inch tapeworm," he said.

When a mouse swallows a tapeworm egg, the egg hatches into a larva, which invades the intestinal lining. The larva emerges from the intestinal wall and then becomes an adult. However, the eggs of this adult worm are incapable of developing within this host, apparently because of an immunity produced in the intestinal wall.

On the other hand, if a previously uninfected mouse swallows the tapeworm larva, the resulting adult worms can reproduce within the animal in one prolific generation.

Immunity occurs during the second gen-

eration when the hatched larvae attack the intestinal wall.

The key to the immune process in this case is the penetration of intestinal tissue cells by the larvae. Some sort of local antibody reaction apparently is brought about by the biochemical changes resulting from the temporary occupation of the intestinal cells by the larvae.

These particular tapeworms are commonly found in man, Dr. Heyneman said. Up to two percent of the population of the United States may have them. They usually pose no serious problem, but occasionally children may become seriously ill from toxic by-products of a large mass of tapeworms.

Science News Letter, December 15, 1956

## PUBLIC HEALTH

### Atomic Radiation Proofs Food Against Insects

► STORES OF FOOD, clothing and wood, can be made proof against insect damage by use of radiation from waste radioactive fission material from the nation's atomic power plants, Dr. Charles C. Hassett of the Army Chemical Center, Md., reports in *Science* (Nov. 23).

Promising to allow the stockpiling of critical defense materials as well as material for commercial use, the method recommended by Dr. Hassett would use cesium 137, mixed fission products or spent fuel rods from nuclear reactors as the radioactive sources.

The material to be processed would be wrapped in insect-proof covers and then irradiated with rays that would kill all existing insects. The taste and vitamin content would not be affected, and the radiation would not induce radioactivity.

The cost of the treatment is estimated to range from 75 cents to \$10.00 per ton of material treated, depending upon the radiation source used.

Science News Letter, December 15, 1956

## TECHNOLOGY

### Radar Meter Catches Only Speed Violators

► SPEEDERS may soon be caught by a radar set that spots violators only.

The device can be pre-set from 25 miles per hour to any limit. It then only registers the speed of vehicles, passing in either direction, that are exceeding the limit.

A camera can be attached to the radar set to record on film the car's license number and the speed reading on the meter. By the same token, a tape recorder can be attached to the device to record the speed reading and traffic officer's verbal description of the car, driver and license number.

The meter can also be synchronized with a remote portable traffic light set to stop a speeding car.

The new radar traffic aid was developed by Admiral Corporation in Chicago.

Science News Letter, December 15, 1956

## PSYCHOLOGY

### Mental Illness Strikes More Women Than Men

► THE CHANCES for good mental health are best for a middle aged man, it was reported to the National Association for Mental Health meeting in Washington.

Dr. George S. Stevenson, medical consultant for the association, said that mental illness strikes the young adults and the aged much more frequently than those of middle age, and more women than men.

Reporting on a 40-year study of mental disease, Dr. Stevenson said that schizophrenia, a mental disorder accounting for half of all mental hospital patients, usually strikes those in the 20- to 35-year bracket. In new cases the ratio of women to men is 3 to 2.

The other two of the three big mental cripples are cerebral arteriosclerosis and senile psychosis, both of which claim most of their victims after 60, he said.

Although comparatively free from mental illness now, Dr. Stevenson said, middle age is beginning to look like a danger area again because of the increase of involutional psychosis. This disease claims most of its victims between 48 and 58 and now ranks fourth as a contributor to mental hospital patients.

Dr. Stevenson said the study exposes as a "gross exaggeration" the common belief that "our mental hospitals are filled with old folks who have nothing wrong with them, but who are dumped there by relatives who do not want to be bothered with them."

Science News Letter, December 15, 1956

## MEDICINE

### Divorced Women Suffer Most From Arthritis

► ARTHRITIS is more common among married women than it is among single ones, but is even more prevalent among divorced women.

Dr. Sidney Cobb, University of Pittsburgh School of Public Health, reported a long-range study of the disease to the American Rheumatism Association meeting in Bethesda, Md. He said that although it has been known the disease strikes more women than men, the new study showed prevalence of the disease increases in women after they get married.

Dr. Cobb also found that women who are separated from their husbands or have been divorced or widowed suffered more from the disease than those who remained married.

The possible reason for these findings, he said, may be that emotional factors play a major role in triggering the start of the disease. Single women perhaps do not experience the emotional problems that come with marriage and raising a family.

Dr. Cobb based his findings on a study of 80,000 people in Pittsburgh.

Science News Letter, December 15, 1956

## MEDICINE

# Therapeutic Toys

**Toys are used to stimulate handicapped children to new activity. They can be used as treatment to develop muscles as well as for development of the other senses.**

By DOROTHY SCHRIVER

➤ TOYS mean happy children. And at Christmas underneath a glittering tree they become one of the symbols of Christmas, happiness and youthful pleasure.

At this joyful time of holiday feasting and family reunion, gaily painted toys are eagerly awaited by millions of children of all ages.

The wonder and the happiness of toys are a special gift to other children throughout the year, children who have handicaps toys help to remedy. For toys, and the pleasure they give, are good medicine.

Those who work with crippled children have discovered that the same toys bringing such pleasure at Christmas can be used to stimulate a child to new activity through imaginative play. They become effective methods of treatment. A cunning doll or a mechanical toy can be used to develop weak muscles and provide motivation.

For a child who does not have full use of his muscles, a toy is invaluable. The play material needs to be scientifically selected for the greatest muscle development. A series of studies on using toys in the treatment of handicapped children have been conducted by the American Toy Institute, research division of the Toy Manufacturers of U.S.A., Inc., in cooperation with the National Society for Crippled Children and Adults.

## Find Suitable Toys

Purpose of the research was to discover what available toys were suitable for use in treatment of children with varying disabilities and to develop new toys which would be useful.

Drawings showing the pictures of body motions, together with simple explanations, were sent to toy manufacturers. They were asked to supply toys that would call for these motions in play.

Using toys in therapy is not a new idea. For a long time therapists have either made the toys they needed for treatment or used certain types of educational toys already on the market. The recent research has greatly increased the number of toys available as well as their usefulness.

Toys for handicapped children cannot be classified by age groups, but rather by development of muscular skill. Greatest satisfaction comes from toys so sturdy they will not break when dropped or go to pieces when handled unskillfully. Those that do not wobble or tip over easily are also important.

Because handicapped children often make random and unskilled movements, and have inadequate hand grasp, toys are dropped and banged more frequently and with greater force than ordinarily, which often makes the child discouraged and prevents him from making further effort.

Attractive looking toys are desirable. Bright and gaily painted toys are more successful than those lacking eye appeal.

Modeling clay, or dough, is used to stimulate motion of the fingers and strengthen grasp. As the muscles show graded improvement, blocks that are sized differently may be used to continue this therapy.

The occupational therapist uses toys as preliminary training for such activities as



*To grasp and lift a doll almost her own size stimulates delighted effort in this little girl. Such attempts may also help her improve muscular coordination.*

eating, dressing and other functional activities. Shoe lacing, peg toys and stringing of beads help eyes and hands work together.

Not only are toys useful for stimulating motion, but also for development of the other senses. Musical blocks are used for children who need training in hearing. Children suffering from poor vision are

given toys with clear color contrast in simple, definite shapes.

Those who have speech problems play with toys having the sounds the children need to learn how to make. Such toys are plastic fish or plastic funnels, which help them to shape the letter "f."

Games of "going to the store," where many different items are offered for sale, stimulate a child to talk as well as to make physical efforts to use the articles.

A mechanical dog or rabbit that moves along the floor is an excellent stimulation to make a child go after it even if he has never used his legs to crawl. He will lie flat on his stomach and stretch just as far as he possibly can in an effort to reach the animal.

In this way, he learns gradually to use his legs to push himself forward.

## Color and Sound Helpful

Brightly colored push-pull toys that make sounds or ring bells attract and stimulate children, and thus encourage crawling and walking, as well as offering opportunity for imaginative play.

The sounds and bells aid in speech and vocalization as the children try to imitate the sounds.

Toys are as important in the home as they are in clinical therapy. There is no substitute for toys. They are the most effective equipment to use in developing improved muscular coordination.

However, in addition to a toy's therapeutic value, it is important for the child to have toys to occupy his time at home. With them he should find some degree of satisfaction in accomplishment and should be happy.

A child will learn to play imaginatively using a toy he enjoys. It is possible that he will find uses for a familiar toy that will help him move on to the next development level.

## Provide Outlet for Feelings

Toys are valuable in providing for the expression of feeling. It has been found that clay is exceedingly effective as an outlet for disturbed children. Toys that provide for hammering and the use of tools, as well as toy trains, have proved to be good outlets for expressing frustration and pent-up emotions.

To be useful, toys must fit the child as well as aid in accomplishing training. The right toy is the one that will give the child something to do in imaginative play and at the same time develop abilities.

Toys are no longer merely playthings, but are now useful tools in helping handicapped children live more normal and happy lives.

## TECHNOLOGY

**Process for Making Better Cheese Faster**

► A FAST, simple method has been developed for making Cheddar cheese from pasteurized milk.

The U. S. Department of Agriculture scientists who developed the process say the body and texture of cheese made in the new way are superior to those of high-grade cheese made by present methods.

The cheese is waxy and nearly free of mechanically-caused holes. The researchers say "an excellent mild flavor" develops within three months when the cheese is cured at 55 degrees Fahrenheit.

Unlike old techniques, the new process requires only two and one-half hours. Although the system has not been used commercially, it has been tested on a pilot-plant scale and is ready for trial by industry.

A streptococcus organism is one of the elements used to start the necessary lactic acid formation. The bacteria, scientifically described as a "non-hemolytic strain of streptococcus durans," produce lactic acid in milk and cheese at the high temperatures essential to processing.

The recommended manufacturing procedure: pasteurize and cool the milk; add two lactic acid starters—conventional Cheddar cheese starter and streptococcus; add setting (rennet); cut the curd into one-fourth-inch cubes, stir to prevent clumping but avoid breaking curd particles; 20 minutes after cutting, cook and drain the whey; add salt; pass through a hoop covered with cheesecloth; press 30 minutes, dress, press overnight.

Science News Letter, December 15, 1956

## ZOOLOGY

**Elephants Outwit Electric Fences**

► WILD ELEPHANTS are often too smart to be fooled by the shocking tickle of electric fences.

Three British scientists, J. A. Hislop, E. O. Shebbeare and A. H. Fetherstonhaugh, all of whom have had experience in Malaya, have differing opinions about the effectiveness of electric fences in keeping elephants out of areas where they are not wanted. There is no question but that elephants are difficult to deal with because of their size and sagacity.

The conclusion seems to be that electric fences are better than no fences at all, but that care must be taken in constructing them and seeing that they are in working order.

Electric fences have been found useful in protecting rubber estates in Malaya from wild animals. Even the elephants can be kept out of restricted areas provided the electric fences are not erected across a major migration route, and the elephants have adequate fodder and enough room in which to roam.

Science News Letter, December 15, 1956

## MEDICINE

**Deep-Seated Cancers Hit**

► HOPE FOR TREATING persons with cancers deep within their bodies by bombarding the cancers with rays from a powerful cyclotron was voiced by Dr. Rollin K. McCombs, University of California.

Such bombardments have been used to penetrate successfully the deep-seated pituitary gland of breast cancer patients without damaging the tissues in between, Dr. McCombs told the Radiological Society of North America meeting in Chicago.

With protons produced by a 340,000,000-electron-volt cyclotron at the University of California, 26 patients with advanced stages of breast cancer were treated. All 26 failed to respond to conventional treatment.

Only two patients are still alive, Dr. McCombs reported. However, he said, hope is held out for the cyclotron as a weapon in the fight against cancer.

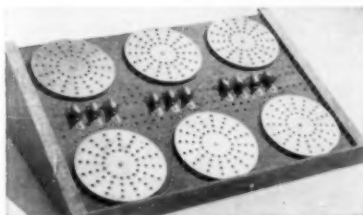
The California radiologist stated, "I be-

lieve we have achieved our purpose, the destruction of a deep-seated organ without damage to intervening tissues. I believe that some of our patients have been benefited and that we have demonstrated that we can depress the pituitary function and destroy the pituitary without subjecting the patient to a craniotomy, with its mortality and morbidity."

Research has also shown, Dr. McCombs reported, that in addition to five patients who showed some healing of bone lesions after treatment, there were two in which the bony metastases remained stationary for several months.

The results of using the powerful cyclotron, he said, indicate the technique will be of value in the treatment of pituitary tumors as well as Cushing's disease. Further research is needed, Dr. McCombs said.

Science News Letter, December 15, 1956

**Can you think faster  
than this Machine?**

Control panel of GENIAC set up to do a problem in space ship engineering

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**ADVANCES IN CARBOHYDRATE CHEMISTRY:** Vol. 11—Melville L. Wolfrom and R. Stuart Tipson, Eds.—*Academic Press*, 465 p., illus., \$11.00. Included in this volume is a generalized cumulative index to Volumes 1-10.

**BITUMINOUS COAL TRENDS 1956**—*National Coal Association*, 164 p., illus., paper, single copies free upon request to publisher, 802 Southern Building, Washington 5, D. C. Recording and documenting the changing patterns in the coal industry, and pointing up coal's place as a vital energy source, this book will serve as a reference for those interested in the progress of the coal industry.

**THE CHEMISTRY AND TECHNOLOGY OF LEATHER:** Volume 1, Preparation for Tanning—Fred O'Flaherty, William T. Roddy and Robert M. Lollar, Eds.—*Reinhold*, 495 p., illus., \$14.00. The making of leather is generally conceded to have been the first manufacturing process of man.

**DESCRIPTIVE GEOMETRY**—Steve M. Slaby—*Barnes & Noble*, College Outline Series, 353 p., illus., paper, \$2.25. Presenting the basic principles of descriptive geometry in clear, annotated pictorial representations followed by graphic examples.

**HOW TO COLLECT AND PRESERVE INSECTS**—H. H. Ross—*Natural History Survey Division*, 111 nois—59 p., illus., paper, 10 cents. Instructions for the amateur and hobbyist.

**LANGUAGE FOR EVERYBODY:** What it is and How to Master it—Mario Pei—*Devin-Adair*, 340 p., illus., \$5.00. Discussing the construction of languages and their influence on thought.

**LECTURES ON THE ICOSAEDRON AND THE SOLUTION OF EQUATIONS OF THE FIFTH DEGREE**—Felix Klein, translated by George Gavin Morrice—*Dover*, revised ed., 289 p., paper, \$1.85. An inexpensive reprint of this well-known monograph.

**MOMENTUM TRANSFER IN FLUIDS**—Win. H. Corcoran, J. B. Oppel and B. H. Sage—*Academic Press*, 394 p., illus., \$9.00. Covering the area of fluid mechanics relating to laminar and turbulent shear-flow, boundary-layer analysis and statistical treatment of turbulence of special interest to chemical engineers.



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**RAYLEIGH'S PRINCIPLE AND ITS APPLICATIONS TO ENGINEERING:** The Theory and Practice of the Energy Method for the Approximate Determination of Critical Loads and Speeds—G. Temple and W. G. Bickley—*Dover*, 121 p., illus., paper, \$1.50. A republication of the first edition of 1933.

**RHEOLOGY: Theory and Applications**, Volume 1—Frederick R. Eirich, Ed.—*Academic*, 761 p., illus., \$20.00. Here authorities on the science of deformation and flow pool their knowledge and make it available in condensed form.

**SCATTER PROPAGATION: Theory and Practice**—Ira Kamen and George Doundoulakis—*Howard W. Sams*, 197 p., illus., \$3.00. Not only for engineers who wish to familiarize themselves with the work in this field, but also for the technician who will play the important roles in installing, operating and maintaining these systems, expected to network the earth.

**SCIENCE AND ENGINEERING IN AMERICAN INDUSTRY: Final Report on a 1953-1954 Survey**—Helen Wood and others—*Govt. Printing Office*, Bureau of Labor Statistics for National Science Foundation, 119 p., illus., paper, 70 cents. Statistics on expenditures for research and development and discussion of factors affecting them.

**SERVICES FOR CHILDREN WITH HEARING IMPAIRMENT: A Guide for Public Health Personnel**—Committee on Child Health of the A.P.H.A.—*American Public Health Association*, 124 p., paper, \$1.50. A guide to general principles in community organization.

**SERVICES FOR CHILDREN WITH VISION AND EYE PROBLEMS: A Guide for Public Health Personnel**—Committee on Child Health of the A.P.H.A. and the National Society for the Prevention of Blindness—*American Public Health Association*, 112 p., paper, \$1.50.

**SYNTHETIC POLYPEPTIDES: Preparation, Structure, and Properties**—C. H. Bamford, A. Elliott and W. E. Hanby—*Academic*, 445 p., illus., \$10.00. A comprehensive survey of knowledge of this class of high polymers with unique characteristics of particular interest because of their relation to proteins.

**TRAFFIC ASSIGNMENT BY MECHANICAL METHODS**—Karl Moskowitz and others—*Highway Research Board*, Bulletin 130, 77 p., illus., paper, \$1.50. Use of machines in working out the flow of traffic.

**UNDERSTANDING YOUR MENOPAUSE**—Stella B. Applebaum with Nadina R. Kavinoky—*Public Affairs Committee*, Public Affairs Pamphlet No. 243, 28 p., illus., paper, 25 cents. Information tending to allay some of the fears which many women suffer unnecessarily along with the natural discomforts of the "change of life."

**WIDENING AND RESURFACING WITH BITUMINOUS CONCRETE**—Ernest Zube and others—*Highway Research Board*, Bulletin 131, 46 p., illus., paper, 90 cents. Containing four papers presented at the 35th Annual Meeting, January, 1956.

Science News Letter, December 15, 1956

The practice of fertilizing forests to increase wood production is considerably more advanced in West Germany than in the United States.

About 180 species of fish and shellfish are used on American tables.

## MEDICINE

### Tranquilizer Checks Pregnancy Nausea

► **EXPECTANT MOTHERS** can get relief from the nausea and vomiting, or morning sickness, of early pregnancy by using the latest tranquilizing drug to be introduced to the medical profession.

The drug is a chemical relative of chlorpromazine, now widely used to treat mental illness.

For mild or moderate emotional problems, the drug promises to be a good relaxer or tranquilizer, but its chief value is expected to come from its quick anti-vomiting effect not only in pregnancy but in virus stomach and intestinal disorders, after operations and radiation treatment, in terminal cancer and other conditions.

The drug is called Compazine by its U. S. manufacturer, Smith, Kline and French, Philadelphia.

Science News Letter, December 15, 1956

## ANTHROPOLOGY

### Find More Bones Of Ancient Creature

► **NEW FINDS** of the 10,000,000-year-old human-like creature whose bones were left in a lignite deposit in Tuscany, Italy, were reported to Science Service by Dr. Helmut de Terra, Columbia University geologist.

They include a nearly complete skull, several skull fragments, the major portion of a hand and parts of the backbone. The bones, when they are cleaned and subjected to detailed study, may enable anthropologists to determine whether the creature, now called "Oreopithecus," or mountain ape, was really a man or an ancestor of modern man.

The discoveries were made by Dr. J. Hurseler of the Natural History Museum at Basel, Switzerland, and Dr. de Terra. It was Dr. Hurseler who brought the 26 fragments of fossils found earlier to the United States to be seen by American anthropologists.

The latest explorations were sponsored by the Wenner-Gren Foundation for Anthropological Research of New York.

Science News Letter, December 15, 1956

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## TECHNOLOGY

# See Manned Rocket Ships

► A MANNED ROCKET SHIP capable of going half way across the continent in 20 minutes was described by G. Harry Stine of the White Sands Proving Grounds, New Mexico, at the American Rocket Society meeting in New York.

He said such a rocket ship might be possible in five years.

The rocket ship, dubbed the "Griffon," would carry a light-weight pilot, not over 150 pounds, weigh more than 65,000 pounds at take-off, and shoot 75 miles up into space in about five seconds.

Then it would level off, reenter the atmosphere, and glide the rest of the way to its destination.

The Griffon would be the first step toward developing rocket transports that could circle the earth, Mr. Stine said, and would supply much needed research data for future space flights.

He pointed out that one problem is determining what will happen to a man when he is weightless for more than 30 seconds.

Some studies have already been made for short periods of subgravity, but medical men are looking for a way to extend the time.

The rocket ship would be built along the same lines as the Air Force's present experimental plane, the Bell X-2. That way, Mr. Stine said, we can take advantage of what has already been learned.

The Griffon would have provisions for control either by the pilot or by ground stations. If the pilot lost consciousness at any time during flight, small-auto control systems would take over until he recovered. Mr. Stine suggested that these could be similar to units developed for V-2 rockets.

The rocket motor would use a combination of gasoline and liquid oxygen for fuel. Since the liquid oxygen would be kept at 300 degrees below zero Fahrenheit, some of it could be used to keep the ship cool. The ship would be able to land at present day airports and would have a landing speed of about 150 miles per hour.

The cost of a project such as the Griffon, Mr. Stine said, would be much less than that of present day un-manned rockets. These are sent off once and never used again.

The Griffon could be refueled and then sent back up for more research.

Science News Letter, December 15, 1956

## PUBLIC HEALTH

# Trace TB Germ Spread

► RESEARCH on how tuberculosis germs spread from infected people to healthy ones is underway at the Veterans Administration hospital, Baltimore.

Two hundred guinea pigs will be kept for many months in an exposure chamber where they will breathe air that has been drawn from the rooms of TB patients. They will be watched for any signs of the disease.

The studies are designed to show whether or not active TB patients actually contaminate the air they breathe.

Dr. Ross L. McLean, director of professional services at the hospital, said this may well be the most important way that

infectious cases infect other persons.

Laboratory tests with rabbits have shown that only very tiny particles, which float in the air like smoke, carry the TB germs into the lungs of healthy animals. Because these carrying particles are so small, Dr. McLean said, ultraviolet light treatment of the air has been effective in protecting the animals.

The number of guinea pigs in the exposure chamber that get TB and the amount of time it takes them to develop the illness will measure how much TB patients infect the air they breathe.

If it is proved that TB patients produce the same kind of minute infective particles that were so infectious for experimental animals, Dr. McLean said, new methods for protecting those who care for TB patients may be found.

Although staff members and volunteer workers are protected well enough now, findings of the research project may be used to develop methods which are much simpler in practice than present techniques, he said.

The research is being conducted by Dr. Richard L. Riley, Johns Hopkins University School of Hygiene and Public Health, in association with William Firth Wells, VA consultant on airborne infection, Mrs. Cretyl C. Mills, bacteriologist, and Dr. Walenty Nyka, pathologist.

Science News Letter, December 15, 1956

## TECHNOLOGY

# Auto Ignition Systems Will Use Semiconductors

► AUTOMOBILE IGNITION systems will be available in the future using semiconductors, Joseph S. O'Flaherty, manager of Hughes Aircraft Company semiconductor division, predicted in Los Angeles.

Semiconductors constitute the relatively new kind of materials used in manufacture of transistors, diodes and power rectifiers that do not require vacuum tubes.

Semiconductors are now a \$60,000,000 business, with Hughes Aircraft producing about a fifth of the output.

Solid state physics, which produced the semiconductors, will play a large role in the future of electronics, with computers, instrumentation, industrial controls, electronic systems of factories, power and electrical industries using the devices.

Science News Letter, December 15, 1956

## ENGINEERING

# Dial Radio Telephones Planned for Farms

► RADIO TELEPHONES for isolated rural areas are being planned by Government engineers.

The U. S. Department of Agriculture said scientists were trying to develop radio telephones that will work directly into dial telephone switching equipment.

The dial-operated radio telephones would give service to remote ranches and farms that cannot be served by wire lines, would provide mobile subscriber service to vehicles, and would provide radio-telephone communication between the telephone office and its own vehicles.

The project is being conducted by the Rural Electrification Administration in collaboration with private firms under contract with the Department of Agriculture.

Science News Letter, December 15, 1956

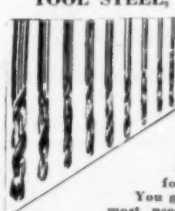
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## Questions

**BIOCHEMISTRY**—When does wound healing begin? p. 370. ☐ ☐ ☐

**GEOLOGY**—What are believed to be the steps in formation of Colorado Plateau's uranium? p. 375. ☐ ☐ ☐

**MEDICINE**—How effective is hypnosis during bone setting? p. 372. ☐ ☐ ☐

**PSYCHOLOGY**—Why is it thought that one out of three Americans does not marry? p. 370. How many levels of sleepiness have been found? p. 373. ☐ ☐ ☐

**SURGERY**—What are cholangiograms? p. 376. ☐ ☐ ☐

**PHOTOGRAPHS**: Cover, Du Pont Company; pp. 371 and 375, British Information Services; p. 373, Hughes Aircraft Company; p. 378, Crippled Children and Adults of Rhode Island, Inc.; p. 384, Eastman Chemical Products, Inc.

## Do You Know?

A single *witchweed*, a plant parasite, may produce up to 500,000 microscopic seeds.

At least one-third of all the *coffee* served in American homes today is made from instant products.

A \$300,000,000 *water control* project in Florida, scheduled for completion in 1965, involves an area larger than Massachusetts, Connecticut and Rhode Island, and directly concerns a third of Florida's population.

World *rice* production in 1956-57 is expected to reach a new high record.

In Oak Park, suburb of Detroit, *traffic tickets* are issued to youngsters for jaywalking, running from between parked cars, playing ball in the street and riding bikes across busy intersections.

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## PSYCHOLOGY

# Meeting Extraterrestrials

► **EXTREME CARE** will be needed in meeting any beings from other worlds that humans may contact during space exploration, Andrew G. Haley told the American Rocket Society meeting in New York.

The general counsel of the Society said treating non-earth creatures as if they were human beings might well mean the destruction of such creatures. He urged adoption of a new Golden Rule for space—Do unto others as they would have done unto them.

Mr. Haley assumes that any extraterrestrial space explorers might meet would be composed of the same elementary substances now known to man. They would be, he believes, large aggregates of these atoms capable of sensation, locomotion and thought.

Scientists should be able to place lower and upper limits on the size and weight of such beings, based on considerations of biophysics, the theory of logical machines, and the dynamics of bodies and structural analysis.

Flights into interplanetary space, Mr. Haley said, will have an appreciable effect

only if any other-world creatures intercept enough energy radiated by a space ship to detect such energy above the background level.

This would be so whether the radiation is in the form of particles, heat waves or radio waves.

Using the probable limits of size and weight and of radiation effects, the closest distance a space ship can approach such a hypothetical being without having an effect can be calculated. Mr. Haley suggests calling this sphere surrounding an individual the "zone of sensitivity."

Space outside an individual's zone of sensitivity, he urged, should be free space to which the traditional freedom of the seas applies.

Mr. Haley quoted Dr. Harlow Shapley's conclusion that there is no longer doubt that whenever the physics, chemistry and climates are right on a planet's surface, life will emerge and persist, although it might not take the same form as human life.

Science News Letter, December 15, 1956

## TECHNOLOGY

# Telephone Pole Shortage

► **THE CRY** of "timber" is getting fainter in forests where tall timber is grown for use by utility companies on which to string their transmission lines.

The tall timber shortage was revealed by F. R. O'Brien, head of the engineering and metallurgy division of the Southern Research Institute, Birmingham, Ala.

Two problems seem to be plaguing the tall timber trees, one natural and the other man-made.

The first is the pileated woodpecker, who seems to enjoy knocking on electric utility poles. The second is the increased use of southern pine trees for saw logs and pulpwood.

The South, where poles from 60 to 80 feet tall are the traditional carriers for transmission lines, seem to be the hardest hit. With a good coating of preservative, these poles last from 20 to 40 years. However, with fewer trees ending up as upright poles and with woodpeckers chopping them up, the Institute reports that "it does not seem likely that the present shortage of pine poles will be relieved in the near future."

In an effort to solve the current shortage, scientists are trying to find suitable substitutes. They are currently experimenting with laminated wood poles, concrete poles and metal poles.

They also state that there is high hope for the use of plastic poles in the future. One such plastic pole has already been designed. In tests to date, the results of its suitability tests have been described as "ex-

cellent." The weight saved by plastic poles is an important factor. A 35-foot plastic pole weighs only 150 pounds as compared to its wooden counterpart weighing 780 pounds.

As for the woodpeckers, scientists are busy trying to discover the reason why the bird picks on wooden poles carrying transmission lines. If the reasons for the pole attack are found, Mr. O'Brien said, "methods of prevention may be devised."

Science News Letter, December 15, 1956

## ENTOMOLOGY

# Multicolor Cockroaches Found by "Black Light"

► **THE COCKROACH** has been found to be constantly emitting a rainbow of fluorescent colors.

The various tissues, organs and products of 19 species of the cockroach give out dark greens, bright blues and pale yellows, scientists at the U. S. Army Quartermaster Research and Development Center, Natick, Mass., report.

Visible only under ultraviolet or "black light," the multi-color cockroaches are constantly changing their fluorescent colors, Edwin R. Willis and Louis M. Roth state in the *Annals of the Entomological Society of America* (Sept.).

These changes in certain organs, the Army scientists think, indicate changes in secretory activity and may prove valuable visual indicators for further study of the small house pest.

Science News Letter, December 15, 1956

## GENERAL SCIENCE

# Venezuela's Manpower

A rapidly expanding technology, spurred by discovery of immense natural resources, has created a problem for Venezuela: the lack of adequately trained manpower.

By HOWARD SIMONS  
from Venezuela

➤ A PRESENT-DAY PROBLEM plaguing this nation points up a current world ailment that may develop into a chronic disease.

Rich in two major resources, oil and iron ore, Venezuela is poor in a third, scientific manpower.

Not too unlike its neighbor to the north, the United States, Venezuela's current manpower shortage has been brought about by a rapidly expanding technology.

In this respect it is a symbol of what could happen in many other nations of today's world. Seemingly dormant for centuries, material wealth is uncovered and overnight a nation is transformed from a "have-not" country into a "have" nation. All too often, however, where money and materials are available, manpower is lacking. Then, like any other raw material, it must be imported or developed within the country. The first solution is quick. The second takes a long time. Venezuela is currently using both methods.

Dr. Dario Parra, minister of education, told SCIENCE SERVICE that it is impossible to foresee an end to the importation of foreign scientists and technologists at the present. Even if Venezuela thought it had enough for a moment, he explained, its economy is expanding so fast there would be another shortage in just a few years.

At the same time, Dr. Parra pointed out, more and more Venezuelan students are enrolling as science students in the nation's universities. So strong has the attraction to science been in the past few years that, for the first time in Venezuela's history, the number of engineering students at the University of Caracas, the country's largest, now outnumber the traditional leading subjects, law and medicine.

## WASHINGTON SCHOOL COLLECTION

This collection has been popular for years in High Schools. It includes 20 of the most important and common rocks and also 20 common minerals. Each of the 40 specimens is about 2" in size and imbedded in cotton in a strong partitioned box size 10 1/2 x 16 1/2 x 1 1/2". A set of unlabeled small specimens for quiz and identification purposes is included without extra charge. Price \$9.00 prepaid. Booklet, Introduction to Geology for the Layman \$0.40.

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At the University of Caracas in 1954, there were 888 engineering students, compared to 1,289 medical students. This year, there are 1,320 engineering students, compared to 1,260 medical students.

The emphasis is not being put on higher education alone, Dr. Parra said. Science training is being stepped-up throughout Venezuela's primary and secondary schools.

To solve a parallel shortage of properly trained teachers, a new law was passed this year to permit teachers to obtain a graduate degree through correspondence courses.

Dr. Parra said that although "one type of study should not be neglected to the advantage of another, the trend towards more science students is very advantageous for our nation at this particular time."

## Venezuelan Ladies Fed

➤ LADIES are being fed a special diet in Venezuela.

If they like their fare, they will be bred in large numbers and then unleashed to prey on a similar, but natural diet throughout the countryside.

The ladies in question are lady beetles. They are being bred and groomed in captivity at the Center of Agricultural Investigations, Maracay, for use as natural insecticides.

Lady beetles, explained Dr. Fernando Kern, head of the Center's department of pests and diseases, feed on aphids, cutworms, cotton leaf worms and other injurious pests. If they can be bred in captivity in large numbers, they can be set out in farms to help control the damaging insects they feed on.

To breed them, Dr. Kern has concocted a special diet rich in vitamins and hormones. It is a liver extract from fresh liver that has been enriched with vitamins and hormones, frozen, sugared, and unfrozen.

The lady beetles appear to relish their man-made diet. Experiments show that they already have doubled their egg output.

Science News Letter, December 15, 1956

The leading cause of fires in buildings in 1955 was careless smoking and matches, 122,000 fires.

About one in every three families in the U. S. owns a dog and one out of five owns a cat.

American fishermen will take more than 5,000,000 pounds of fish from the seas in 1956 and set an all-time national record, it is predicted.

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❄️ **ARTIFICIAL SNOW FLAKES** give a wintry look to evergreens, Christmas trees, gift wrappings and other holiday decorations. Available in a 16-ounce, pushbutton container, the snow flakes are easy to apply or remove, flame resistant, and can be used indoors or out, the makers state.

Science News Letter, December 15, 1956

🎲 **STOCK MARKET GAME** comes in regular and advanced versions. It consists of instructions, playing cards, stock certificates, play money and a stock market indicator, numbered on four sides. There are 16 special occasion cards for use with the advanced version of Bulls 'n' Bears.

Science News Letter, December 15, 1956

🎄 **CHRISTMAS TREE APRON** dresses up the bottom of the tree stand and also catches the needles that invariably fall from Christmas trees. The holiday designs decorating it are an appropriate background for Christmas presents placed under the tree.

Science News Letter, December 15, 1956

🚒 **FIRE ENGINE** for junior, shown in the photograph, gets into action at the push of a button. Powered by standard flashlight batteries in a separate control case, the remote-controlled toy is molded of an acetate



plastic. It has an 18-inch extension ladder, removable ladders, a flashing dome light, a sounding siren and dual rubber wheels.

Science News Letter, December 15, 1956

🐦 **AUTOMATIC BIRD FEEDER** protects seeds from weather and bird-feed robbers, yet makes food available on a self-service basis. The perch serves as a trip lever to

dispense a limited quantity of seed upon a tray when a bird alights or leaves. The all-metal device holds up to five pounds of seed and can be suspended by chain from a tree branch.

Science News Letter, December 15, 1956

👗 **HOLIDAY APRON** is printed in gay, indelible holiday colors on a white background of heavy washable cotton. The festive design includes a song, holly leaves and the inscription, "Happy Holidays."

Science News Letter, December 15, 1956

🔧 **PLASTIC ADHESIVE** saves stitching decorations to fabrics. The liquid adhesive can be applied by brush, squeeze bottle or machine and dries completely transparent. It can be used to attach flowers, ornaments, beads, linings, ribbons, etc., to cotton, rayon, acetate, metal, straw or other materials.

Science News Letter, December 15, 1956

🚧 **SNOW SHOVEL** works on the principle of a bulldozer and is said to clear snow faster and easier than it can be shoveled. Sliding on sled runners, the shovel throws the snow in front of it. Only pushing is needed to remove snow from sidewalks and driveways. The device can also be used for leveling and grading dirt, sand or gravel.

Science News Letter, December 15, 1956



## Nature Ramblings



### By HORACE LOFTIN

➤ "I'LL TAKE that one," you say, as you point with your finger to the Christmas tree of your choice. But what kind of Christmas tree are you choosing?

The great favorite in this country, in terms of numbers bought, is the balsam fir. Fir trees can be told by their soft, blunt-pointed needles that curve upward slightly. Also, fir cones sit upright on the branches like short, fat candles.

The Douglas fir is the second most-bought American Christmas tree. In spite of its name, however, this tree is not a true fir, but belongs technically somewhere between spruces and firs.

You can identify the Douglas fir by its cones, for between each of the scales on the cones is a little three-pronged projection, found on neither firs nor spruces.

Third most popular Christmas tree is the little black spruce, the typical "grocery store" Christmas tree. Although only two

### Christmas Trees



or three feet tall, these black spruces may be 25 to 50 years old. The large group of spruce trees can be told from firs and Douglas firs by their small, sharp-pointed, prickly needles. Also, spruce cones are small and hang downward from the branches.

Pines are easy to identify, since their needles always come in bundles of two or more, joined at the base by paper-like tissue.

Spruce, fir and Douglas fir needles are attached singly to the branches. White pines always have five needles in the bundle. Yellow pines have a varying number of needles per bundle, but two is usual.

The Christmas trees described above all have one thing in common—cones. Two other popular Christmas trees, redcedar and arbor vitae, have berries instead of cones.

The redcedar is especially beautiful, but its small, delicate needles fall off too easily for it to be welcome in the house.

Arbor vitae has "fern-like" branches and small, scaly leaves. It is known more as an ornamental than as a Christmas tree, although its popularity at Christmas-time is increasing.

Last year, an estimated 35,000,000 were used in American homes at Christmas. Of this number, some 11,000,000 were imported from Canada, with the remainder coming from native forests and nurseries.

Science News Letter, December 15, 1956